FACTS ON FILE

EMSP

Environmental Management Science Program

Project Highlights

The Environmental Management Science Program (EMSP) is funding basic research projects focused on solving the most difficult problems that threaten the closure plans of DOE sites. This fact sheet highlights just one.

Colloid Transport and Retention in Fractured Deposits

The overall goal is to assess the relative influence of chemical and physical factors expected to influence colloid transport in fractured materials and investigate strategies for predictive simulation at the field scale. The experimental methods each operate at different physical/geological scales and can be used with different degrees of experimental control. This approach allows testing of hypotheses in a relatively simple setting in the laboratory where individual chemical or colloidal characteristics can be varied and the results can then be compared with field-scale experiments where the influence of realistic geologic heterogeneity can be incorporated. Understanding the processes that control colloid behavior will increase confidence with which colloid-facilitated contaminant transport can be predicted and assessed at various contaminated DOE sites.

Locations: Oak Ridge National Laboratory, Ohio State University, Los Alamos National Laboratory, University of Tennessee, University of Wales

Year of Award: 1996

Amount of Award: $1,100,000

Office of Environmental Management (EM) Problem Area: Remedial Action

Office of Science (SC) Scientific Category/Sub-Category: Hydrogeology/Fluid-flow and Colloidal Dynamics

Research Value/Impact: Currently, research has yielded new insights into colloid transport and its importance to contaminant mobility at DOE sites by quantifying the importance of both physical factors (particle diameter, flow velocity, and fracture density) and chemical factors (ionic strength, cation valence, and likely pH of the carrier solution) on the potential for colloid transport.

Lead Principal Investigator:
John F. McCarthy
Oak Ridge National Laboratory
(423) 576-6606

Other Principal Investigators:
Larry McKay
University of Tennessee
(423) 974-0821

Paul Reimus
Los Alamos National Laboratory
(505) 665-2537

Motomu Ibaraki
Ohio State University
(614) 292-7528

Liyuan Liang
University of Wales
(011) 441-22-874-576

More Information on the Web:
http://www.em.doe.gov/science or
http://www.id.doe.gov/emsystems/emsp